Preparation and photocatalytic activity of nitrogen doped TiO2 treated by microwave with urea

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Nitrogen doped TiO_2 photocatalysts were prepared by microwave treatment for investing the visible light photocatalytic activity. Surface properties of nitrogen doped TiO_2 were analyzed by SEM, XPS, and XRD. For evaluating of the photocatalytic activity of the nitrogen doped TiO_2, the removal capacity of toluene gas was also investigated under the LED visible light. The XPS results showed that the nitrogen composition onto TiO_2 increased according to the amount of urea. Under the LED visible light, photocatalytic activity of 3 g-urea treated TiO_2 (1 g-base) was highest than that of other urea treated TiO_2. Improved photocatalytic activity of nitrogen doped TiO_2 is attributable to the doped nitrogen anion which is helpful to reduce the band gap of TiO_2.